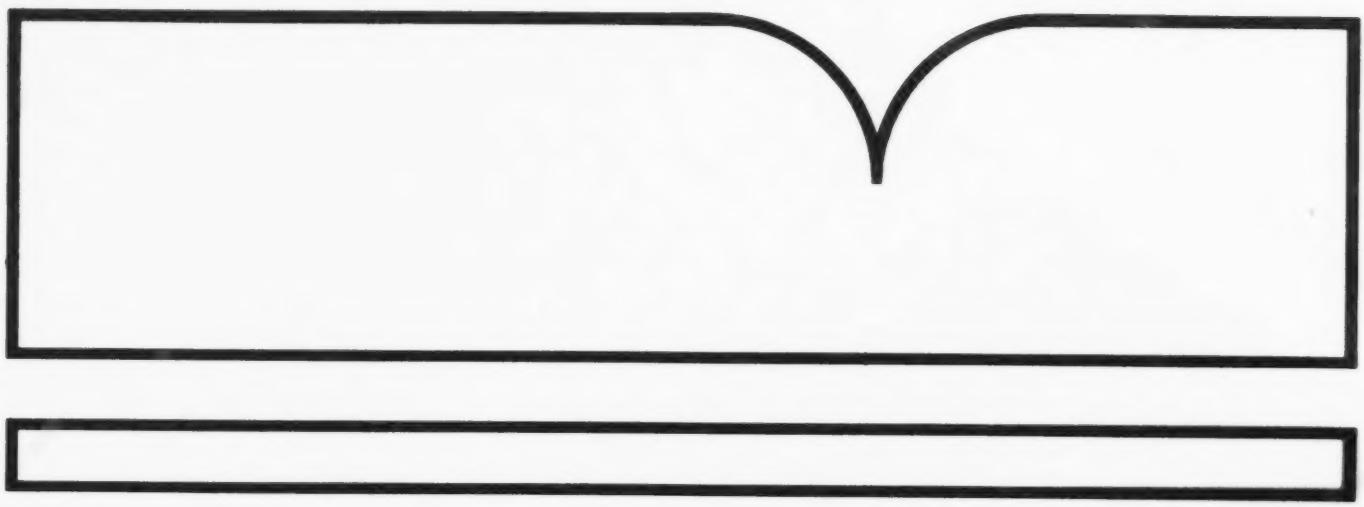
PB80-173867

Evaluation of an Automobile Power and Deceleration Governor

(U.S.) Environmental Protection Agency
Ann Arbor, MI

Apr 74



U.S. Department of Commerce
National Technical Information Service
NTIS

EPA-AA-TAEB 74-29

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Test and Evaluation Branch
Emission Control Technology Division
Environmental Protection Agency

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NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-AA-TAEB 74-29		

4. TITLE AND SUBTITLE	5. REPORT DATE
Evaluation of an Automobile Power and Deceleration Governor	April 1974
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
no author	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
U.S. Environmental Protection Agency Emission Control Technology Division Test and Evaluation Branch Ann Arbor, MI. 48105	11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
Same as Box 9	Technical
	14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

Mr. Coye Conner, representing Mr. Edward Smith, inventor of the Power and Deceleration Governor, contacted the Mobile Source Air Pollution Control laboratory in Ann Arbor, Michigan, to request a laboratory and engineering evaluation of Mr. Smith's invention. Submitted with the request was a test report prepared by Automotive Research Associates, Inc. of San Antonio, Texas, indicating significant reductions of exhaust emissions. A confirmatory test program was conducted by the Test and Evaluation Branch of the Emission Control Technology Division.

The Power and Deceleration Governor is a vacuum controlled throttle valve assembly installed between the carburetor and the engine intake manifold. The control mechanism of the device affects a carburetion cut-off during deceleration and limits throttling during acceleration. There are no parameter changes made to the engine's basic spark timing, idle CO setting, or idle rpm. ~~The entry of the device is approximately~~

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air Pollution Control Emission Exhaust Gases Tests Exhaust emissions Motor Vehicles	Power and Deceleration governor	

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE UNLIMITED	UNCLASSIFIED	
	20. SECURITY CLASS *(This page)* UNCLASSIFIED	22. PRICE

EPA Form 2220-1 (9-73)

Background

Mr. Coye Conner, representing Mr. Edward Smith, inventor of the Power and Deceleration Governor, contacted the Mobile Source Air Pollution Control laboratory in Ann Arbor, Michigan, to request a laboratory and engineering evaluation of Mr. Smith's invention. Submitted with the request was a test report prepared by Automotive Research Associates, Inc. of San Antonio, Texas, indicating significant reductions of exhaust emissions. A confirmatory test program was conducted by the Test and Evaluation Branch of the Emission Control Technology Division.

Device Description

The Power and Deceleration Governor is a vacuum controlled throttle valve assembly installed between the carburetor and the engine intake manifold. The control mechanism of the device affects a carburetion cut-off during deceleration and limits throttling during acceleration. There are no parameter changes made to the engine's basic spark timing, idle CO setting, or idle rpm. The cost of the device is approximately $50 and can be installed in about one hour.

Test Program

A 1966 Chevrolet Impala, 283 CID, supplied by the inventor was used in the testing. Three tests were conducted, two with the device installed, and one with a standard carburetor. Two additional tests were run with the standard carburetor, but were invalid due to an exhaust system leak. All testing was performed in accordance with the 1975 Federal Test Procedure as outlined in the November 15, 1972, Federal Register. The tests were conducted using the standard dynamometer inertia loading of 4000 pounds and Indolene 30 as the test fuel.

Test Results

The test results are presented in the Appendix of this report. These results are summarized as follows:

Summary of Emission Results
% Change from Baseline

	PDG Device
HC	18% increase
CO	23% decrease
CO_2	13% increase
NOx	45% decrease
Fuel Economy	5% penalty

Conclusions

1. Significant penalties in hydrocarbon emissions and in fuel economy resulted from the device installation. Carbon monoxide and oxides of nitrogen were significantly reduced.

2. Vehicle driveability with the device was not evaluated, but would require analysis in any further development effort.

APPENDIX

Comparison of 1975 FTP Emission Results with and without the Power and Deceleration Governor

Date	HC gm/mi	CO gm/mi	CO_2 gm/mi	NOx gm/mi	Fuel Economy
Without Device					
4-5	7.02	79.2	454.45	3.32	14.8
With Device					
4-2	8.32	57.9	509.95	1.71	14.4
4-3	8.22	61.2	513.40	1.82	14.1
% Emission Change					
	-17.8%	22.7%	-12.9%	45.2%	-4.7%

NOTE: a negative sign indicates an increase of emissions or fuel economy penalty.